Kontyû, Tokyo, 56 (3): 600–617. September 25, 1988

The Japanese *Acrosathe* (Diptera, Therevidae)

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Abstract The Japanese *Acrosathe* is revised. The genus contains 4 species, of which 2 are described as new to science.

LYNEBORG (1986) recognized 9 species of *Acrosathe* from the Palearctic and Oriental Regions. Two new species from Japan are here added.

The described species of *Acrosathe* are now distributed as follows: a total of 10 species, Europe, Central Asia (Kazakh), Siberia, China and Japan; 1 species, Taiwan; 6 species, N. America.

The terminology of the male genitalia is in accordance with IRWIN and LYNEBORG (1981). The abbreviations used in the figures are as follows: AE, aedeagus; C, cercus; DAP, dorsal apodeme; DP, distiphallus; EAP, ejaculatory apodeme; EP, epandrium (=tergum 9); GC, gonocoxite; GS, gonostylus; H, hypandrium; KP, knob-like process (in posterolateral part of ventral part of gonocoxite); PAP, parameral apodeme; PLP, posterolateral process of aedeagus; PP, parameral process; SC, sclerotized lateral part of dorsal apodeme; VAP, ventral apodeme; VEPS, ventral epandrial sclerite (=sternum 10); VL, ventral lobe.

Genus *Acrosathe* IRWIN et LYNEBORG

Acrosathe IRWIN et LYNEBORG, 1981, Bull. Ill. nat. Hist. Surv., **32**: 223. Type species: *Bibio annulata* FABRICIUS, 1805, from Europe, by original designation.

For diagnosis of this genus, see LYNEBORG (1986). The Japanese *Acrosathe* (including 4 species) runs to couplet 5 in the key to the Nearctic genera by IRWIN and LYNEBORG (1981) and misses its true position, because the face is not pilose in the Japanese species.

Acrosathe is very similar to *Irwiniella* LYNEBORG, 1976, but may be separated from the latter by the structure of the male genitalia, that is, the presence of a pair of posterolateral processes in the aedeagus.

Except for the male genitalia, which are very distinctive in all species, the four species discussed in this paper are very similar to one another. However, they may be separated by the external characters set up in the key (a).

The four species of *Acrosathe* known from Japan live on sandy sea shores.

Male genitalia. The common characters in the male genitalia of the Japanese species are given below.

Paired gonocoxites narrower than length of gonocoxite (including parameral process); parameral process over 1/2 as long as rest of gonocoxite along lateral margin, and roughly as long as gonostylus; parameral process and gonostylus rather conical viewed from some angles; ventral lobe elongate and its outer length shorter than gonostylus; a knob-like process present on posterolateral part of ventral gonocoxite; gonocoxites widely separated from each other ventrally; hypandrium very short and running transversely; parameral apodeme variable in length with species but comparatively short; ventral part of gonocoxite (except anterior part) with long hairs; aedeagus longer than gonocoxite along lateral margin; distiphallus long or rather long and not strongly curved; a posterolateral process, which is usually pointed at apex, present in aedeagus; dorsal apodeme of aedeagus elongate rectangular, wider anteriorly (=apically) or narrower at middle and with lateral borders sclerotized; ventral apodeme of aedeagus shorter than the dorsal, and rounded anteriorly; ejaculatory apodeme long, and stick-like or so in lateral and dorsal views; epandrium wider than or about as wide as its mid-length, with the posterolateral part protruded acutely or bluntly or sometimes expanded and angulate, with the posterior margin widely or narrowly and rather deeply concave, and with long dorsal hairs which are absent on anterior part and apical part of posterolateral process; cercus longer than wide, rounded posteriorly, and with hairs at posterior part; tergum 8 with middle part short and with posterolateral part having long dorsal hairs; sternum 8 wider than long, elliptical or trapezoidal in shape, with posterior margin straight or having a shallow median concavity and having long hairs.

Key (a) to Species of *Acrosathe* from Japan Based on External Characters

1. Male (eyes contiguous) .... 2.
— Female (eyes widely separated) .... 5.
2. Fore and mid femora without anteroventral bristles; width of face at lowest portion from a direct frontal view 0.7–0.9 times distance from antenna to anterior ocellus .... 3.
— Fore and mid femora each with 1 black anteroventral bristle beyond middle; width of face at lowest portion from a direct frontal view 1.0–1.2 times distance from antenna to anterior ocellus; each side of frons with a tuft of pile.. *A. yoshikoae*.
3. Frons with a tuft of pile (4 or more hairs, or numerous hairs) on each side.....

.... 4.

— Frons without pile or with at most 1 or 2 hairs on each side ....*A. tashimai.*

4. Mesonotum exclusively covered with white erect hairs (as in some individuals of *yoshikoae*)..*A. stylata.*

— Mesonotum (except borders) with black erect hairs which are intermixed with white, recumbent ones (as in *tashimai*).......................*A. obsoleta.*

5. Fore and mid femora without anteroventral bristles; width of face at lowest portion from a direct frontal view 0.9–1.1 times (rarely 1.2 times in *obsoleta*) distance from antenna to anterior ocellus; dark spot on abdominal tergum 5 trapezoidal and widely connected with anterior margin of the tergum (this is usually so of tergum 6 in *tashimai*)............................... 6.

— Fore and mid femora each with 1 black anteroventral bristle beyond middle; width of face at lowest portion from a direct frontal view 1.2–1.5 times distance from antenna to anterior ocellus; dark spot on abdominal tergum 5 usually semicircular or triangular, and that on tergum 6 triangular or not produced at middle.................................*A. yoshikoae.*

6. Lower frons with a tuft of hairs (which are 4 or more in number) on each side .... 7.

— Lower frons without hairs or with only 1 or 2 hairs on each side ....*A. tashimai.*

7. Space between posterior ocellus and eye narrower than in *obsoleta* (as in *tashimai*); frons at anterior ocellus 1.2 times as wide as ocellar triangle; width of face at lowest portion from a direct frontal view 0.9–1.0 times distance from antenna to anterior ocellus; mesonotum with three broad darker stripes separated by two narrow white (not brown) gray pollinose vittae (as in *yoshikoae*)..*A. stylata.*

— Space between posterior ocellus and eye wider than in *stylata* (as in *yoshikoae*); frons at anterior ocellus 1.3–1.6 times as wide as ocellar triangle; width of face at lowest portion from a direct frontal view 1.0–1.2 times distance from antenna to anterior ocellus; mesonotum with three broad darker stripes separated by two narrow brown (not white) gray pollinose vittae (as in *tashimai*)..*A. obsoleta.*

Key (b) to Species of *Acrosathe* from Japan Based on Male Genitalia

1. Aedeagal posterolateral process long and narrow, and open space present between the process and distiphallus in lateral view .... 2.

— Aedeagal posterolateral process very short, wart-like, and covered with short hairs, and open space absent between the process and distiphallus in lateral view...*A. obsoleta.*

2. Aedeagal posterolateral processes almost parallel-sided or slightly converging apically; posterolateral part of epandrium tapering apically............. 3.
— Aedeagal posterolateral processes diverging apically; posterolateral rim of epandrium expanded and angulated..........................*A. stylata.*
3. Distiphallus long and tapering apically in dorsal view; aedeagal posterolateral processes distinctly converging apically in dorsal view and not crossing distiphallus in lateral view; dorsal apodeme projecting laterally at anterolateral angle and its lateral sclerotized part wide; ventral lobe with narrow rounded apical section...*A. tashimai.*
— Distiphallus short and almost parallel-sided (excepting base) in dorsal view; aedeagal posterolateral processes slightly converging apically in dorsal view and crossing distiphallus in lateral view; dorsal apodeme angulate at anterolateral part and its lateral sclerotized part narrow; ventral lobe without narrow apical section....................................*A. yoshikoae.*

Acrosathe obsoleta Lyneborg

[Japanese name: Hama-tsurugi-abu]

(Figs. 1–12)

Acrosathe obsoleta Lyneborg, 1986, Steenstrupia, **12**: 108. Type locality: China (Tien Mu Shan).

Besides male genitalia, this species may be separated from *stylata* by having the characters shown in the key (a) (couplets 4 and 7).

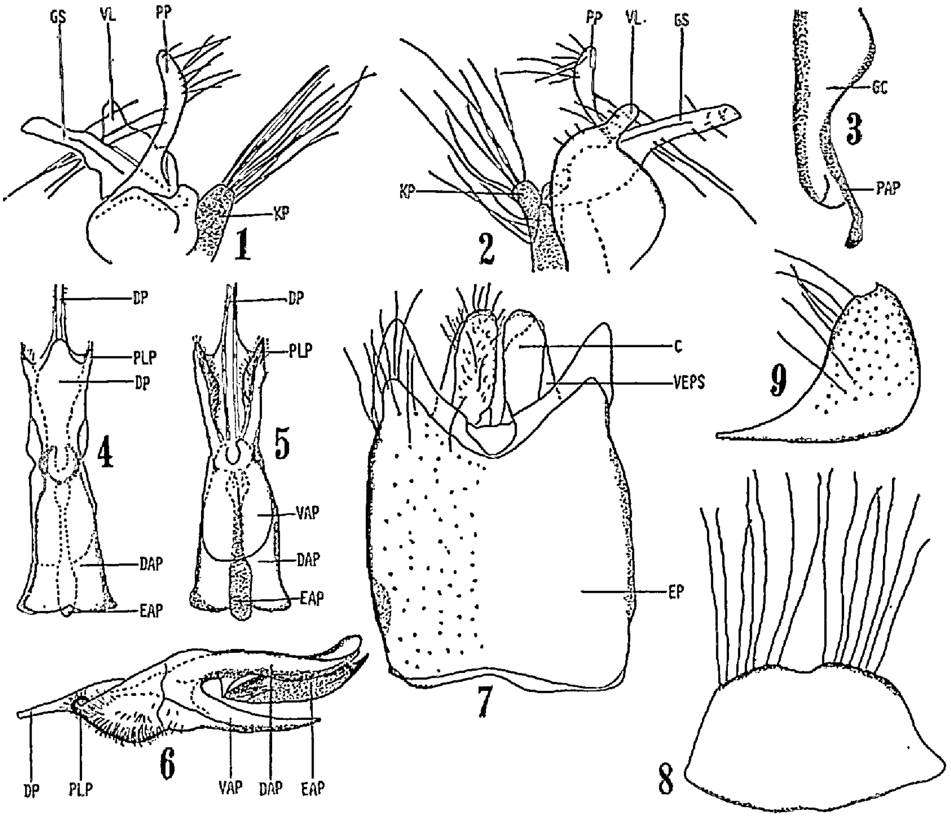
Fitting the description of *tashimai* except for the notes below.

Male. Head: Frons with a pair of tufts of several white hairs (some of which often change into black); eyes contiguous for a distance which is 0.5–0.9 times as long as ocellar triangle; total widths of 3–4 largest facets equal to width of anterior ocellus; half width of head 1.3–1.5 times width of frons just above antennae from a direct frontal view, and 1.1–1.2 times width of face at lowest portion from a direct frontal view, which is 0.8–0.9 times distance from antenna to anterior ocellus (almost as in *tashimai*); distance from antenna to ventral base of proboscis 0.8–1.0 times that from antenna to anterior ocellus; relative lengths of antennal segments 1, 2, 3 and style (along outer surface) 100: 33 (31–35): 172 (154–183): 45 (33–55) and their relative widths (except that of style) from the side 51 (40–60): 56 (50–60): 59 (50–70); data based on 10 specimens.

Thorax: Often *sc* 3 and *dc* 2 in number on each side (this may be so in *tashimai*).

Wing: As in *tashimai.*

Legs: Relative lengths of segments (excluding coxa and trochanter) of fore leg 184 (173–193): 203 (187–213): 100: 35 (30–38): 27 (23–30): 16 (13–17): 22 (17–26), of mid leg 198 (183–207): 226 (210–234): 130 (123–134): 49 (43–52): 33 (30–36): 14 (13–16): 22 (19–26), of hind leg 256 (235–270): 313 (281–329): 134 (123–144): 59 (53–65): 36 (33–39): 16 (13–17): 22 (20–26) and in hind leg from the



Figs. 1–9. Male genitalia of *Acrosathe obsoleta*. —— 1, Latero-outer view; 2, latero-inner view; 3, dorsal view; 4, dorsal view; 5, ventral view; 6, lateral view; 7, dorsal view; 8, sternum 8, ventral view; 9, lateral part of tergum 8, dorsal view (not flattened out; hairs are probably cut short).

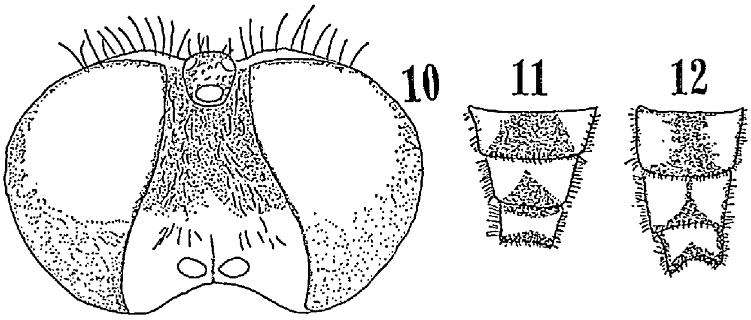
side, relative widths of femur, tibia and tarsal segments 1–3, 31 (27–34): 20 (17–23): 15 (13–17): 12 (10–14): 10 (9–12); (N=10).

Abdomen: As in *tashimai*.

Genitalia (Figs. 1–9): Ventral lobe wide at basal part and tapering to a rounded apex; gonostylus gradually narrower toward apex and pointed at inner tip; parameral apodeme may be longer than in any of the other 3 species treated in this paper; distiphallus comparatively short and narrow, tapering apically, and curving slightly downward; aedeagal posterolateral process very short, wart-like, and covered with short hairs, and in lateral view no open space present between the process and distiphallus; dorsal apodeme wider anteriorly (=toward base of abdomen) and its sclerotized lateral margins narrow; epandrium shorter in midline than wide and its posterolateral part tapering apically; sternum 8 rather trapezoidal; see the originally description (LYNEBORG, 1986) which supplements the notes above. Specimens dissected: 1 ♂, Wajiro, Fukuoka City, 17. ix. 1982, H. HAYASHI; 1 ♂, Tsuyazaki, Fukuoka Pref., 9. x. 1983, A. NAGATOMI.

Length: Body 7.3–9.8 mm; wing 6.5–8.2 mm; fore basitarsus 0.86–1.22 mm.

Female (here described for the first time). Head (Fig. 10): Lower frons with



Figs. 10–12. Female of *Acrosathe obsoleta*. —— 10, Head, direct frontal view; 11–12, abdominal terga 5–7, dorsal view.

a pair of tufts of several black hairs (whose number is 4 or more); upper frons (brown gray pollinose part) 0.7–0.8 times as long as wide and 1.6–2.0 times as long as lower frons; structural characters are almost as in *tashimai*, although some values are given below, based on 10 specimens: half width of head 1.1–1.2 times width of frons just above antenna from a direct frontal view; width of face at lowest portion from a direct frontal view 1.1–1.2 times distance from antenna to anterior ocellus; space between antenna and eye 1.1–1.2 times length of antennal segment 1 (along outer surface); ocellar triangle 0.9–1.0 times as long as wide; distance from antenna to ventral base of proboscis 1.1–1.2 times that from antenna to anterior ocellus; relative lengths of antennal segments 1, 2, 3 and style (along outer surface) from the side 100: 36 (33–38): 159 (146–173): 42 (36–46) and their relative widths (except that of style) 51 (43–60): 51 (43–60): 54 (46–70); length of proboscis measured along ventral surface 0.8–1.0 times distance from antenna to ventral base of proboscis.

Thorax and wing: As in *tashimai*.

Legs: Occasionally fore and mid femora each with 1 or 2 black bristles whose locations are different from regular bristle in *yoshikoae* (this may be so in *tashimai*); relative lengths of segment of fore leg 172 (166–180): 191 (179–197): 100: 33 (31–36): 26 (24–28): 14 (13–16): 20 (18–21), of mid leg 189 (172–200): 219 (207–232): 130 (121–136): 47 (43–52): 30 (28–33): 14 (12–17): 19 (17–20), of hind leg 240 (224–254): 294 (276–311): 130 (124–137): 58 (55–62): 35 (33–39): 14 (13–16): 22 (21–23) and in hind leg from the side, relative widths of femur, tibia and tarsal segments 1–3, 33 (31–35): 20 (17–21): 15 (13–18): 11 (10–13): 10 (9–11); (N=8).

Abdomen (Figs. 11–12): As in *tashimai*.

Length: Body 8.5–11.4 mm; wing 7.3–8.6 mm; fore basitarsus 1.10–1.34 mm.

Distribution. Japan (Kyushu) (new record), China and Far Eastern Territory of USSR.

Specimens examined (13 ♂♂, 8 ♀♀). *Fukuoka Pref*: 2 ♂♂, 1 ♀, Wajiro, Fukuoka City, 17. ix. 1982, H. HAYASHI; 1 ♀, Tsuyazaki, 7. x. 1982, Y. TAKAKURA; 7 ♂♂, 2 ♀♀, Tsuyazaki, 9. x. 1983, A. NAGATOMI; 4 ♂♂, 4 ♀♀, Jingû, Fukuoka City, 9. x. 1983, A. NAGATOMI.

Acrosathe stylata LYNEBORG

[Japanese name: Nagisa-tsurugi-abu]

(Figs. 13–22)

Acrosathe stylata LYNEBORG, 1986, Steenstrupia, **12**: 107. Type locality: Japan (Sakata, Dewa, Honshu).

Besides male genitalia, this species may be separated from *obsoleta* by having the characters shown in the key (a) (couplets 4 and 7).

Fitting the description of *tashimai* except the notes below.

Male. Head: Frons with a pair of tufts of white hairs (4 or more in number), some of which rarely change into black; structural characters are almost as in *tashimai*, although some values are given below, based on 5 specimens; total widths of 3–4 largest facets equal to width of anterior ocellus; half width of head from a direct frontal view 1.0–1.1 times distance from antenna to anterior ocellus; distance from antenna to ventral base of proboscis 0.9–1.0 times that from antenna to anterior ocellus; relative lengths of antennal segments 1, 2, 3 and style (along outer surface) 100: 40 (36–44): 189 (164–210): 54 (45–67) and their relative widths (except that of style) from the side 50 (50): 55 (50–60): 57 (50–60); length of proboscis measured along ventral surface 0.9–1.0 times distance from antenna to ventral base of proboscis.

Thorax: Hairs on mesonotum wholly white and almost wholly erect.

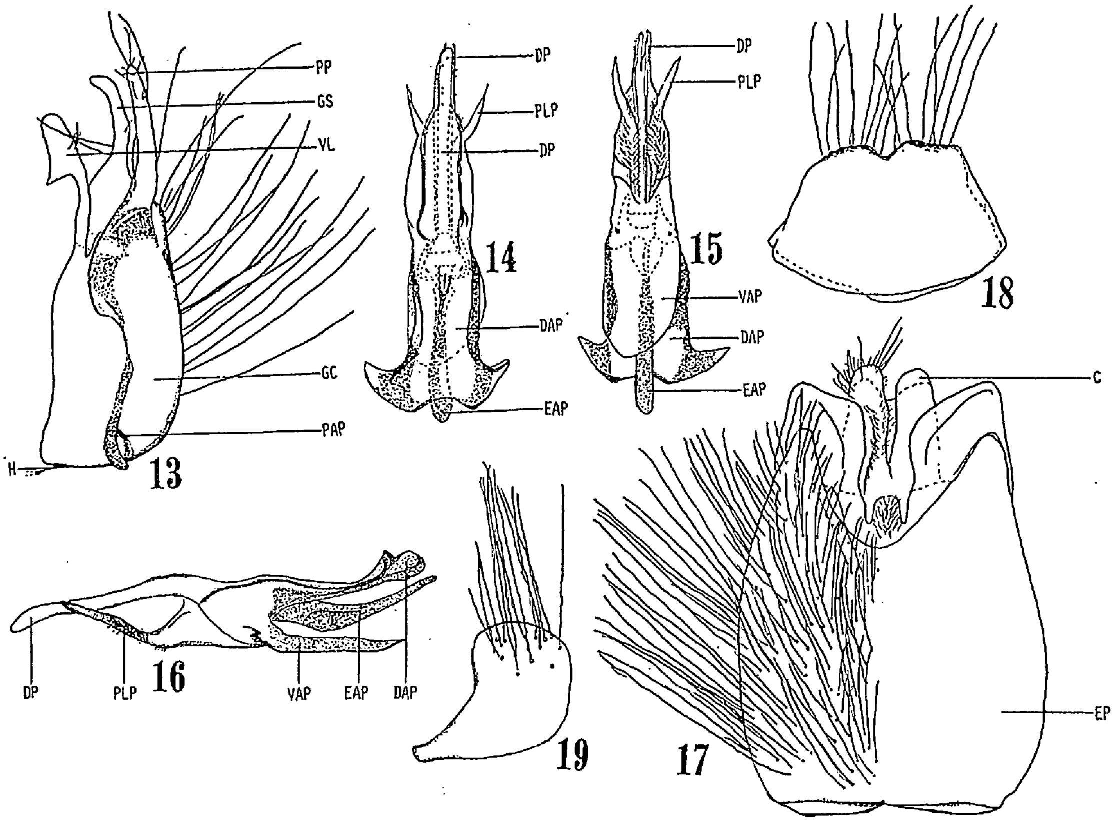
Wing: As in *tashimai.*

Legs: Relative lengths of segments (excluding coxa and trochanter) of fore leg 169 (161–176): 195 (180–207): 100: 37 (36–38): 28 (27–29): 15 (13–18): 19 (17–21), of mid leg 185 (161–197): 219 (207–234): 126 (121–128): 47 (45–48): 31 (30–32): 14 (13–14): 18 (17–21), of hind leg 237 (227–259): 299 (287–310): 131 (123–134): 56 (52–59): 33 (31–36): 14 (13–14): 20 (17–21) and in hind leg from the side, relative widths of femur, tibia, and tarsal segments 1–3, 30 (28–34): 18 (17–19): 15 (13–16): 10 (10–11): 9 (7–10); (N=5).

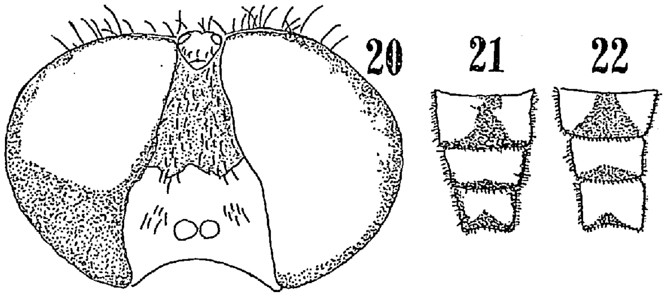
Abdomen: As in *tashimai.*

Genitalia (Figs. 13–19): Ventral lobe gradually tapering toward rounded apex; gonostylus (except base) almost parallel-sided throughout; distiphallus, which curves somewhat downward, long and its basal part over 1/2 abruptly widened and apical part also rather wide (from dorsal view); aedeagal posterolateral processes diverging apically in dorsal view and crossing distiphallus in lateral view; anterolateral part of dorsal apodeme expanded laterally; lateral sclerotized part of dorsal apodeme narrower than in *tashimai*; epandrium long as compared with *obsoleta* and *yoshikoae*; posterolateral rim of epandrium wide and angulate; sternum 8 rather trapezoid; see the original description (LYNEBORG, 1986) which supplements the notes above. Specimen dissected: 1 ♂, Kotoni (near Sapporo), Hokkaido, 10. vii. 1953, S. ITO.

Length: Body 8.8–10.5 mm; wing 7.5–8.0 mm; fore basitarsus 1.10–1.18 mm.



Figs. 13–19. Male genitalia of *Acrosathe stylata*. —— 13, Dorsal view; 14, dorsal view; 15, ventral view; 16, lateral view; 17, dorsal view; 18, sternum 8, ventral view; 19, lateral part of tergum 8, dorsal view (not flattened out).



Figs. 20–22. Female of *Acrosathe stylata*. —— 20, Head, direct frontal view; 21–22, abdominal terga 5–7, dorsal view.

Female (here described for the first time). Head (Fig. 20): Lower frons with a pair of tufts of black hairs (4 or more in number); pollen on upper occiput white rather than brown; upper frons (brown gray pollinose part) 0.9–1.0 times as long as wide and 1.6–1.8 times as long as lower frons; structural characters are as in *tashimai*.

Thorax: Pollen on mesonotum is white (not brown) gray and three broad darker stripes are separated by two narrow white gray pollinose vittae.

Wing: As in *tashimai*.

Legs: Relative lengths of segments of fore leg 160 (156–162): 183 (179–188): 100: 33 (32–35): 25 (24–26): 13 (12–15): 18 (18), of mid leg 175 (174–176): 206 (203–209): 120 (118–121): 44 (44–45): 28 (26–30): 12 (12): 16 (15–18), of hind leg 214 (209–221): 283 (274–294): 126 (118–132): 53 (50–56): 29 (27–32): 12 (12): 18 (17–18) and in hind leg from the side, relative widths of femur, tibia and tarsal segments 1–3, 30 (29–32): 18 (18): 14 (13–15): 9 (9–10): 9 (9); (N=3).

Abdomen (Figs. 21–22): Pile on tergum 7 and sterna 5–6 often chiefly pale.

Length: Body 9.5–10.0 mm; wing 7.7–8.1 mm; fore basitarsus 1.30–1.34 mm.

Distribution. Japan (Hokkaido and Honshu).

Specimens examined (5 ♂♂, 3 ♀♀). [Hokkaido (4 ♂♂, 3 ♀♀)]: 1 ♀, Jôzankei, 15. vii. 1952, K. TSUNEKI; 2 ♂♂, 1 ♀, Kotoni (near Sapporo), 10. vii. 1953, S. ITO; 1 ♀, Kuboteyama, 1. viii. 1958, S. UEDA; 2♂♂, Shari, 8. vii. 1964, A. NAGATOMI. [Honshu (1 ♂)]: 1♂, Sakata, Dewa, 2–14. vii. 1954, K. S.

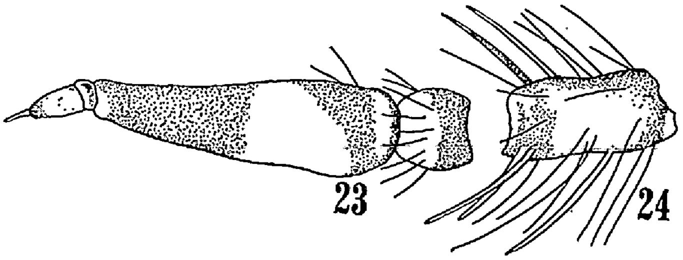
Acrosathe tashimai sp. n.

[Japanese name: Tashima-tsurugi-abu]

(Figs. 23–38)

Among the Japanese species, *tashimai* is characterized as follows: lower frons in both sexes with 0–2 hairs on each side.

Male. Head (Figs. 23–24): Head and its appendages dark brown to black, and white gray pollinose; proboscis very often partly brown; ocellar triangle, vertex and antennal segments 1–2 with black hairs which are shorter on antennal segment 2; hairs on antennal segment 1 partly longer than segment, partly bristle-like, and often intermixed with white ones; occiput with a row of black strong hairs just behind upper eye margin, and scattered, black strong ones, above neck (which are often absent on large area near cerebrale); occiput (excepting cerebrale), cheek, palpus and proboscis with longer, white soft hairs (which become shorter on labellum); frons with 0–2 hairs on each side; eyes contiguous for a distance 0.7–1.3 times as long as ocellar triangle; total widths of 2.5–3 largest facets equal to width of anterior ocellus; half width of head 0.9–1.0 times distance from antenna to anterior ocellus, 1.4–1.6 times width of frons just above antenna, and 1.2–1.3 times width of face at lowest portion from a direct frontal view, which is 0.7–0.8



Figs. 23–24. Male antenna of *Acrosathe tashimai*, outer view. —— 23, Segments 2, 3 and style; 24, segment 1.

times distance from antenna to anterior ocellus; space between antennae 0.1–0.2 times width of ocellar triangle; space between antenna and eye 0.3 times width of frons just above antenna and 0.8–1.1 times length of antennal segment 1 along outer margin; ocellar triangle 1.0–1.3 times as long as wide; distance from antenna to ventral base of proboscis 0.7–0.8 times that from antenna to anterior ocellus; antenna 0.8–0.9 times as long as distance from antenna to anterior ocellus; relative lengths of antennal segments 1, 2, 3 and style (along outer surface) from the side 100: 41 (36–50): 196 (180–238): 59 (50–67) and their relative widths (except that of style) 49 (44–56): 52 (50–63): 55 (50–61); palpus 0.6–0.7 times as long as distance from antenna to ventral base of proboscis; proboscis measured along ventral surface 0.9 times as long as distance from antenna to ventral base of proboscis; data based on 10 specimens.

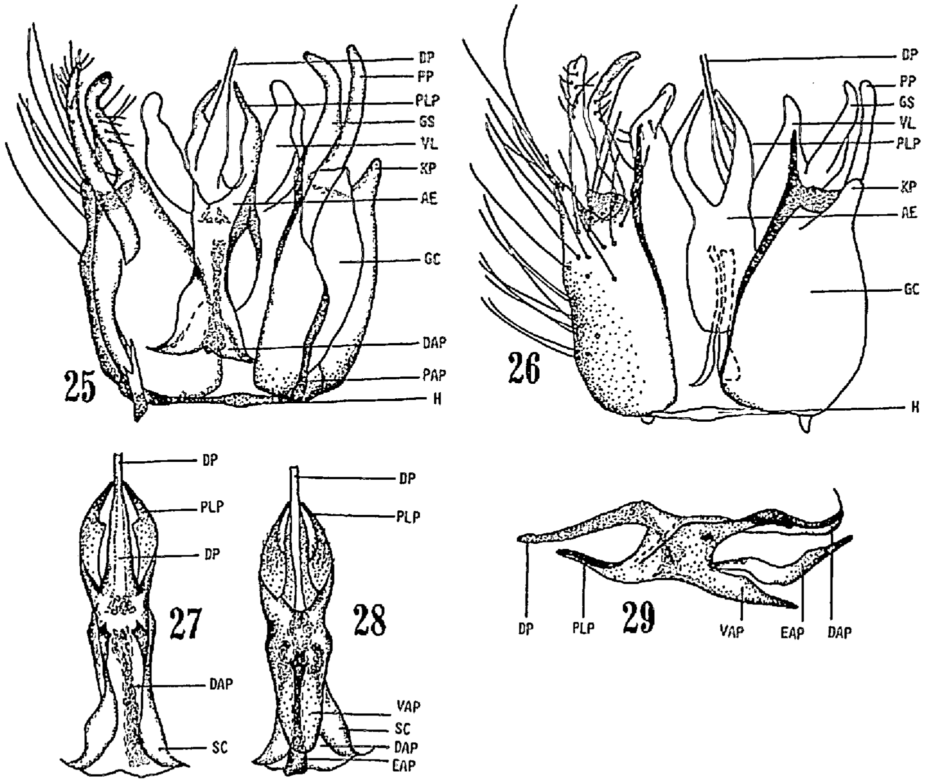
Thorax: Dark brown to black, white gray pollinose, and covered with soft white hairs which are longer on pleura, recumbent on mesonotum except borders, and absent on ptero-, hypo-, anterior part of meso-, posterior part of sterno-, posterior part of metapleura, and postscutellum; mesonotum (except borders) covered with black erect hairs (which are intermixed with white recumbent ones); mesonotum may have 3 darker broad stripes, where pollen is somewhat less distinct; the number of black bristles on lateral borders of mesonotum and margin of scutellum is as follows: 3 notopleurals, 2 supraalars, 1 postalar, and 2 scutellars; usually 1 pair of dorsocentral bristles are also present opposite posterior calli.

Wing: Apical portion of subcostal cell and narrow area just behind it (in marginal cell) yellowish brown; halter dark brown to black, with knob except base pale (or yellowish) brown.

Legs: Dark brown to black, but tibia except for apical portion and base or basal portion of basitarsus yellowish brown to brown; coxa and femur white gray pollinose and with white soft hairs which are recumbent on anterior and dorsal surfaces of fore and mid femora and on hind femur (excepting base); hind femur (excepting base) with a row of 4–7 black bristles along anteroventral surface; relative lengths of segments (excluding coxa and trochanter) of fore leg 180 (163–218): 206 (184–241): 100: 38 (35–41): 29 (27–32): 16 (14–23): 22 (19–27), of mid leg 196 (180–232): 232 (208–273): 130 (120–145): 51 (46–58): 32 (27–36): 15 (13–18): 21 (19–25), of hind leg 260 (236–305): 323 (288–391): 142 (132–168): 63 (59–68): 36 (29–45): 15 (13–18): 22 (19–27) and in hind leg from the side, relative widths of femur, tibia and tarsal segments 1–3, 35 (28–39): 21 (18–23): 15 (12–18): 12 (10–14): 10 (8–12); (N=10).

Abdomen: Dark brown to black, and white gray pollinose; above and below covered with soft white hairs which are absent on sternum 1, midbasal part of tergum 1 and anterior border of segment 2; hairs on dorsum recumbent but longer and erect on sides and those on venter, which are erect in middle, sparser than on dorsum; knob-like process of ventral part of gonocoxite with black hairs.

Genitalia (Figs. 25–34): Ventral lobe squarish basally, then tapering to

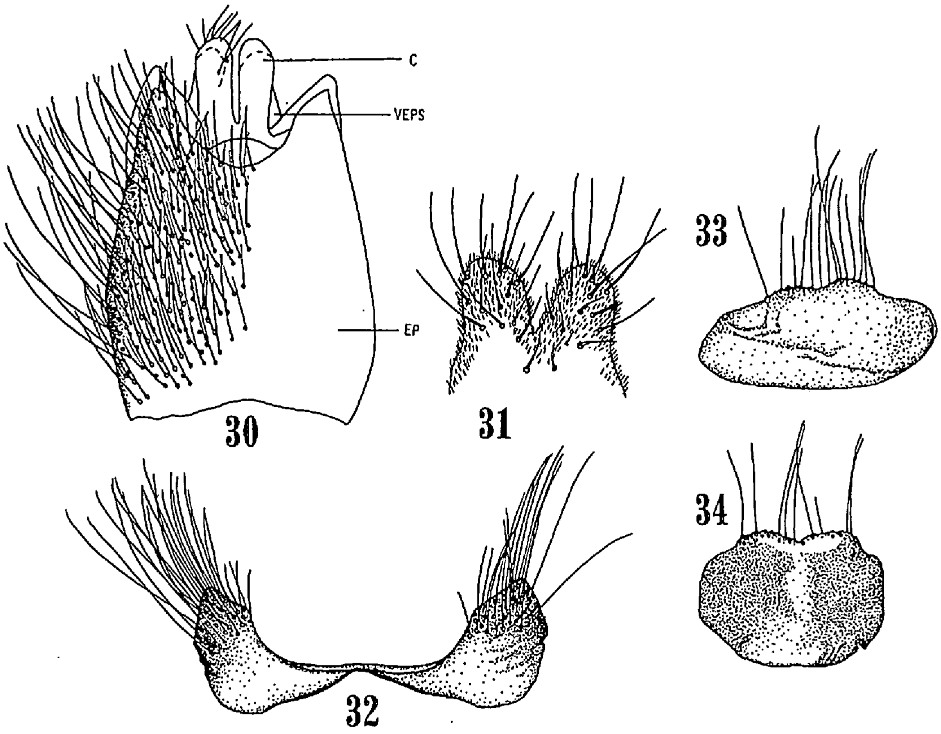


Figs. 25–29. Male genitalia of *Acrosathe tashimai*. —— 25, Dorsal view; 26, ventral view; 27, dorsal view; 28, ventral view; 29, lateral view.

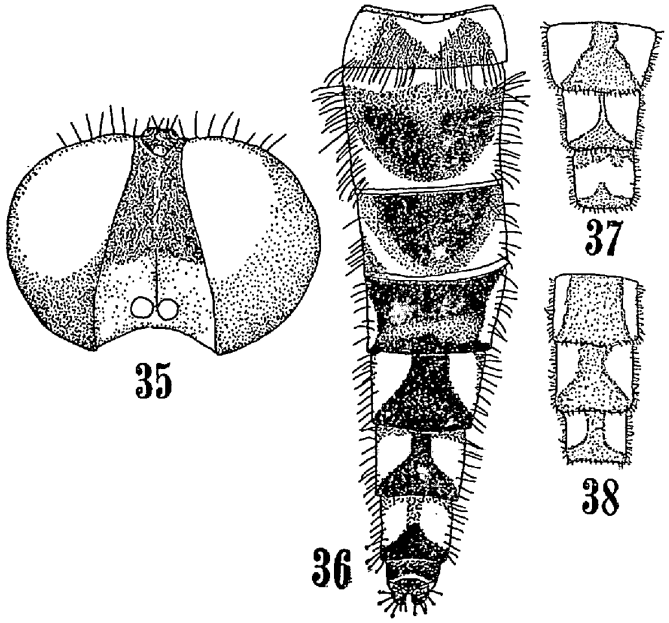
broadly rounded apex; it may be longer than in *yoshikoae* and narrowed apically; gonostylus tapering apically; distiphallus long, being almost straight, and in dorsal view gradually tapering into narrow apex; aedeagal posterolateral processes distinctly shorter than distiphallus, in dorsal view converging apically and in lateral view not crossing distiphallus; anterolateral part of dorsal apodeme protruding laterally; lateral sclerotized part of dorsal apodeme wide (as compared with other species in this paper); epandrium long as compared with *obsoleta* and *yoshikoae*; posterolateral part of epandrium tapering apically; sternum 8 elliptic. Specimens dissected: 2 ♂♂, Nijino-matsubara, Karatsu, Saga Pref., 25. v. 1975, A. NAGATOMI.

Length: Body 7.6–10.0 mm; wing 5.7–8.0 mm; fore basitarsus 0.79–1.14 mm.

Female. Similar to male except as follows. Head (Fig. 35): Upper frons brown (not white) gray pollinose and black haired; pollen on occiput above neck more or less brown; the longest hairs or bristles on antennal segment 1 are shorter than or as long as the segment; bristles on occiput may be stouter than in male and more numerous and stouter than in *yoshikoae*; upper frons (brown gray pollinose part) 0.9–1.1 times as long as wide and 2.4–2.7 times as long as lower frons; width of frons just above antenna 2.4–2.8 times that at anterior ocellus, which is 1.2–1.5 times width of ocellar triangle; half width of head 1.1–1.3 times distance from antenna to anterior ocellus, 1.2–1.3 times width of frons just above antenna from a



Figs. 30–34. Male genitalia of *Acrosathe tashimai*. —— 30, Dorsal view; 31, ventral epandrial sclerite (=sternum 10), ventral view (showing posterior and lateral margins; higher magnification than Figs. 30, 32–34; based on 2nd specimen); 32, tergum 8, dorsal view; 33–34, sternum 8, ventral view (Fig. 34 is based on 2nd specimen, showing variation according to condition).



Figs. 35–38. Female of *Acrosathe tashimai*. —— 35, Head, direct frontal view; 36, abdomen, dorsal view; 37–38, abdominal terga 5–7 (showing individual variation).

direct frontal view, and 1.1–1.3 times width of face at lowest portion from a direct frontal view, which is 0.9–1.1 times distance from antenna to anterior ocellus; distance from antenna to ventral base of proboscis 1.0–1.1 times distance from antenna to anterior ocellus; antenna 1.0–1.2 times as long as distance from antenna to anterior ocellus; relative lengths of antennal segments 1, 2, 3 and style (along outer surface) 100: 40 (36–44): 184 (158–217): 58 (47–75) and their relative widths (except that of style) from the side 48 (40–56): 53 (50–56): 58 (50–67); proboscis measured along ventral surface 0.9–1.0 times as long as distance from antenna to ventral base of proboscis; data based on 10 specimens.

Thorax: Pollen on mesonotum (except sides) and on scutellum (except sides) brown; in mesonotum, erect black hairs are shorter than in male and recumbent ones are brown.

Wing: As in male.

Legs: Relative lengths of segments of fore leg 172 (168–181): 197 (186–204): 100: 36 (35–38): 28 (26–31): 15 (13–18): 22 (19–23), of mid leg 195 (186–204): 225 (213–232): 126 (121–131): 48 (45–50): 32 (29–35): 14 (13–15): 20 (17–23), of hind leg 247 (232–257): 310 (283–322): 136 (130–143): 58 (52–64): 35 (32–39): 14 (13–15): 22 (20–23) and in hind leg from the side, relative widths of femur, tibia and tarsal segments 1–3, 36 (32–41): 21 (18–23): 15 (13–17): 12 (10–13): 11 (9–13); (N=10).

Abdomen (Figs. 36–38): With black markings (where pollen is indistinct or absent) as follows: whole part of segment 8; in each of terga 1–4, large midbasal spot which may be indistinct on tergum 1, is semicircular and nearly reaches (or reaches) the posterior margin on terga 2–3, and is trapezoidal and widely extends to posterior margin on tergum 4; in each of terga 5–7, midapical spot or band, which is trapezoidal and widely connected with anterior margin on tergum 5 and is usually so on tergum 6; the black spots above are distant from lateral margin of dorsum, but those on terga 6–7 and often those on terga 3–5 narrowly reach the lateral margin; hairs on abdomen shorter than in male and those on segments 7–8 and sterna 5–6 (or 4–6) erect and black (this is often so on tergum 6).

Length: Body 7.2–10.9 mm; wing 5.8–8.3 mm; fore basitarsus 0.86–1.22 mm.

Distribution. Japan (Hokkaido, Honshu and Kyushu).

Holotype: ♂, Shikanoshima, near Fukuoka City, 23. v. 1975, A. NAGATOMI. Paratypes (48 ♂♂, 25 ♀♀): — [Hokkaido (10 ♂♂, 6 ♀♀)]. 2 ♂♂, 2 ♀♀, Sanribanya, Lake Saroma, 5. viii. 1959, K. MORIMOTO; 1 ♂, Abasiri, 25. vii. 1962, S. TAKAGI; 1 ♂, Koshimizu, 26. vii. 1962, S. TAKAGI; 1 ♂, Shari-machi, 8. vii. 1964, A. NAGATOMI; 1 ♂, 1 ♀, Shari-machi, 2 & 5. viii. 1967, H. SHIMA; 3 ♂♂, 3 ♀♀, Shibecha, 2. viii. 1967, A. NAKANISHI; 1 ♂, Shari, 5. viii. 1967, A. NAKANISHI. [Honshu (1 ♂, 1 ♀)]. Niigata Pref.: 1 ♂, 1 ♀, 16. vii. 1966, H. SHIMA. [Kyushu (48 ♂♂, 18 ♀♀)]. Fukuoka Pref. (39 ♂♂, 11 ♀♀): 4 ♂♂, Hakozaki, Fukuoka City, 19. v. – 22. vi. 1949, A. NAGATOMI; 21 ♂♂, 7 ♀♀, Hakozaki (Kyushu Univ.), Fukuoka City, 3. vi. & 1–14. ix. 1975, K. ÔHARA; 7 ♂♂, 4 ♀♀, Shikanoshima, near Fukuoka City, 23. v. 1975, A. NAGATOMI; 2 ♂♂, Shikanoshima, near Fukuoka

City, 23. v. 1975, K. KANMIYA; 1 ♂, Wajiro, Fukuoka City, 14. vi. 1981, H. HAYASHI; 4 ♂♂, Wajiro, Fukuoka City, 25. vi. 1982, H. HAYASHI. Saga Pref. (7 ♂♂, 5 ♀♀): 7 ♂♂, 5 ♀♀, Nijino-matsubara, Karatsu, 25. v. 1975, A. NAGATOMI. Kagoshima Pref. (2 ♂♂, 2 ♀♀): 1 ♀, Ôdomari, Sata-chô, 17. x. 1963, A. TANAKA; 1 ♂, 1 ♀, Sata, 18. v. 1966, K. KUSIGEMATI; 1 ♀, Ichiki, 8. v. 1984, A. NAGATOMI.

Holotype in Kagoshima University (Kagoshima) and paratypes in Kagoshima University, Hokkaido University (Sapporo), National Institute of Agro-Environmental Sciences (Yatabe, Ibaraki), Zoological Museum (Copenhagen), British Museum (Natural History) (London) and U. S. National Museum (Washington, D. C.).

This species is named in honor of Dr. Yoshio TASHIMA, Professor Emeritus, Kagoshima University, who is a plant physiologist and the discoverer of flower initiation in total darkness. He has inspired variously the people around him.

Acrosathe yoshikoae sp. n.

[Japanese name: Yoshiko-tsurugi-abu]

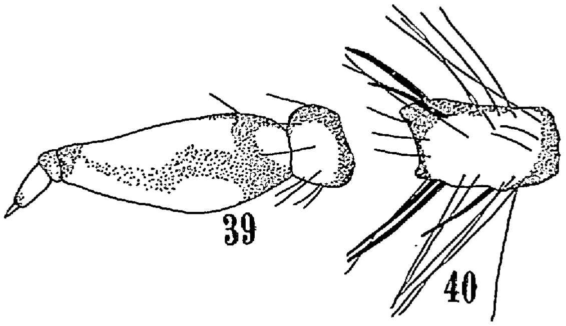
(Figs. 39–53)

Among the Japanese species, *yoshikoae* is characterized as follows: in both sexes frons and face wider than in other species and fore and mid femora each with 1 black anteroventral bristle beyond middle.

Male. Head: Coloration, pruinosity, pilosity, etc. as in description of *tashimai*, but frons with a pair of tufts of several white hairs (some of which often change into black); eyes contiguous for a distance which is 0.6–1.0 times as long as ocellar triangle; total widths of 3.5–4 largest facets equal to width of anterior ocellus; half width of head 1.1–1.2 times distance from antenna to anterior ocellus, 1.2–1.3 times width of frons just above antennae, and 1.0–1.1 times width of face at lowest portion from a direct frontal view, which is 1.0–1.2 times distance from antenna to anterior ocellus; space between antennae 0.1–0.3 times width of ocellar triangle; space between antenna and eye 0.3 times width of frons just above antennae and 0.9–1.1 times length of antennal segment 1 along outer margin; ocellar triangle 1.1–1.2 times as long as wide; distance from antenna to ventral base of proboscis 0.9–1.0 times that from antenna to anterior ocellus; antenna 0.9–1.0 times as long as distance from antenna to anterior ocellus; relative lengths of antennal segments 1, 2, 3 and style (along outer surface) 100: 35 (32–39): 153 (125–188): 60 (48–64) and their relative widths (except that of style) from the side 56 (50–64): 49 (42–56): 54 (44–63); palpus 0.6 times as long as distance from antenna to ventral base of proboscis; proboscis measured along ventral surface 0.8–1.0 times as long as distance from antenna to ventral base of proboscis; data based on 10 specimens.

Thorax: As in *tashimai*; often pile on mesonotum wholly white and almost wholly erect.

Wing (Fig. 41): As in *tashimai*.



Figs. 39–40. Male antenna of *Acrosathe yoshikoae*, outer view; 39, segments 2, 3 and style; 40, segment 1.

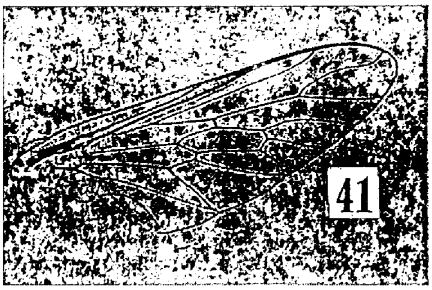


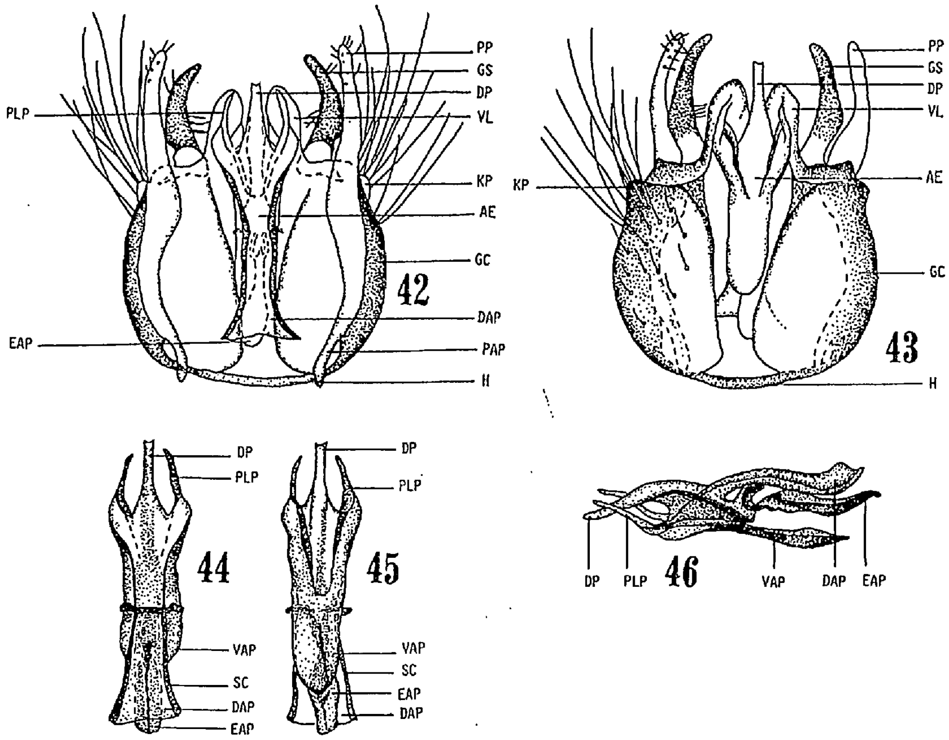
Fig. 41. Male wing of *Acrosathe yoshikoae*.

Legs: Fore and mid femora each with 1 black anteroventral bristle beyond middle; relative lengths of segments (excluding coxa and trochanter) of fore leg 195 (184–209): 212 (196–227): 100: 39 (35–42): 29 (25–33): 18 (16–21): 25 (24–27), of mid leg 210 (196–238): 237 (226–250): 125 (117–135): 50 (43–55): 34 (32–38): 18 (16–20): 25 (24–27), of hind leg 282 (265–291): 334 (317–350): 136 (129–141): 61 (54–70): 39 (37–42): 19 (17–21): 26 (24–29) and in hind leg from the side, relative widths of femur, tibia and tarsal segments 1–3, 36 (33–42): 21 (19–23): 16 (13–17): 12 (10–14): 11 (9–13); (N=10).

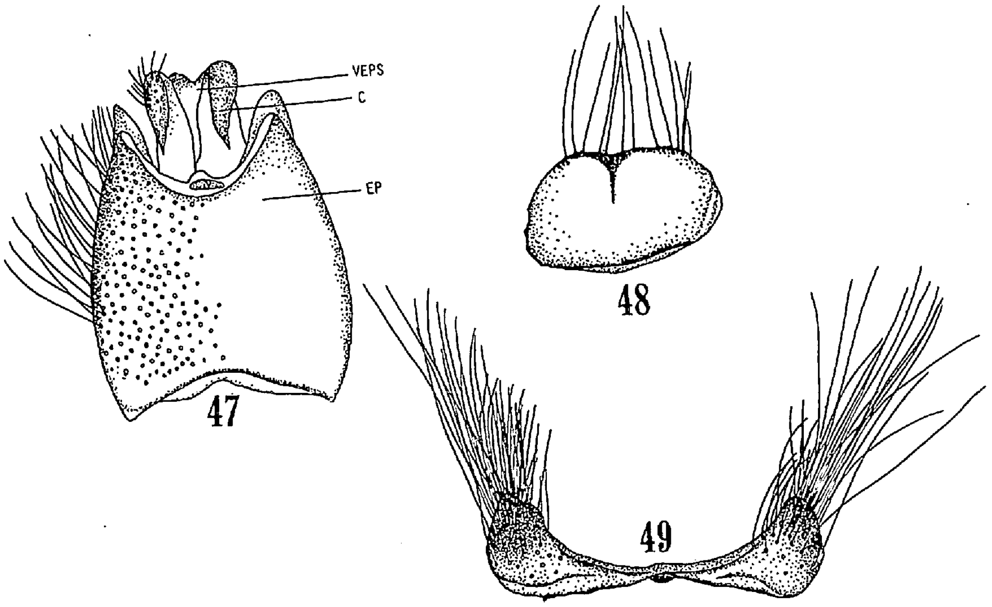
Abdomen: As in *tashimai*.

Genitalia (Figs. 42–49): Ventral lobe rounded in lateral and apical borders and without narrow apical section; gonostylus gradually tapering apically; distiphallus projecting downward obliquely and shorter than in *tashimai*; aedeagal posterolateral processes almost parallel-sided or slightly converging apically in dorsal view and crossing distiphallus in lateral view; dorsal apodeme wider anteriorly (=toward base of abdomen) and angulate at anterolateral corner; lateral sclerotized part of dorsal apodeme narrower than in *tashimai*; ejaculatory apodeme (in dorsal view) may be wider than in other species treated in this paper; epandrium shorter along midline than wide and its posterolateral part tapering apically; hairs on lateral part of tergum 8 very long; sternum 8 elliptic in shape. Specimens dissected: 2 ♂♂, Sata, Ôsumi, Kagoshima Pref., 27 & 29. iv. 1962, A. NAGATOMI.

Length: Body 7.2–9.4 mm; wing 5.9–7.6 mm; fore basitarsus 0.7–1.0 mm.

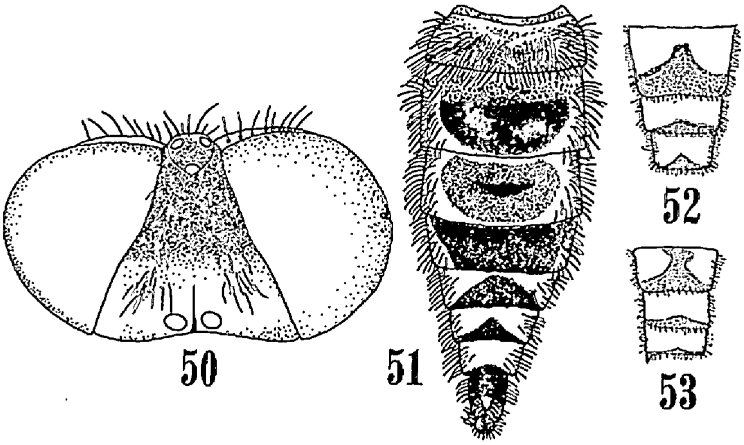


Figs. 42–46. Male genitalia of *Acrosathe yoshikoae*. —— 42, Dorsal view; 43, ventral view; 44, dorsal view; 45, ventral view; 46, lateral view.



Figs. 47–49. Male genitalia of *Acrosathe yoshikoae*. —— 47, Dorsal view; 48, sternum 8, ventral view; 49, tergum 8, dorsal view.

Female. Similar to male except as follows: Head (Fig. 50): Upper frons brown (not white) gray pollinose and black haired; the longest hairs or bristles on antennal segment 1 are shorter than or as long as the segment; bristles on occiput



Figs. 50–53. Female of *Acrosathe yoshikoae*. —— 50, Head, direct frontal view; 51, abdomen, dorsal view; 52–53, abdominal terga 5–7, dorsal view (showing individual variation).

may be stouter than in male and is less numerous and more slender than in *tashimai*; upper frons (brown gray pollinose part) 0.6–0.7 times as long as wide and 1.1–1.7 times as long as lower frons; width of frons just above antennae 2.4–2.6 times that at anterior ocellus, which is 1.4–1.7 times width of ocellar triangle; half width of head 1.1–1.4 times distance from antenna to anterior ocellus, 1.0–1.1 times width of frons just above antennae from a direct frontal view, and 0.9–1.0 times width of face at lowest portion from a direct frontal view, which is 1.2–1.5 times distance from antenna to anterior ocellus; space between antenna and eye 1.1–1.3 times length of antennal segment 1 along outer surface; ocellar triangle 0.8–1.0 times as long as wide; distance from antenna to ventral base of proboscis 1.0–1.2 times distance from antenna to anterior ocellus; antenna 1.1–1.3 times as long as distance from antenna to anterior ocellus; relative lengths of antennal segments 1, 2, 3 and style (along outer surface) 100: 35 (33–40): 153 (133–167): 57 (50–67) and their relative widths (excepting that of style) from the side 57 (50–64): 51 (42–56): 53 (46–56); palpus 0.6–0.7 times as long as distance from antenna to ventral base of proboscis; data based on 10 specimens.

Thorax: Mesonotum with hairs which are partly black and are shorter than in male; three darker broad stripes separated by two narrow white (not brown) gray pollinose vittae (as in male).

Wing: As in male.

Legs: Relative lengths of segments of fore leg 196 (181–224): 215 (200–238): 100: 39 (33–43): 30 (26–36): 18 (15–21): 24 (21–29), of mid leg 215 (200–248): 242 (226–267): 128 (122–138): 51 (45–57): 36 (33–39): 18 (15–21): 25 (23–29), of hind leg 281 (262–324): 335 (307–357): 138 (129–148): 62 (56–67): 41 (37–43): 19 (15–24): 26 (23–29) and in hind leg from the side, relative widths of femur, tibia and tarsal segments 1–3, 38 (33–43): 22 (19–29): 16 (13–21): 13 (11–14): 13 (11–14); (N=10).

Abdomen (Figs. 51–53): As in *tashimai* except as follows: in each of terga

5–7, midapical spot or band is smaller than in *tashimai* and that on tergum 5 often nearly reaches the anterior margin; hairs on segments 5–8 erect and black (often pale on lateral border of tergum 5), as well as some hairs on tergum 4.

Length: Body 7.5–11.3 mm; wing 5.9–7.9 mm; fore basitarsus 0.8–1.1 mm.

Distribution. Japan (Kyushu: Kagoshima Pref.).

Holotype: ♂, Sata, Ôsumi, Kagoshima Pref., 27. iv. 1962, A. NAGATOMI. Paratypes (27 ♂♂, 28 ♂♂): 10 ♂♂, 10 ♀♀, Sata, Ôsumi, 27 & 29. iv. 1962, A. NAGATOMI; 1 ♂, 2 ♀♀, Sata, Ôsumi, 29. iv. 1966, A. TANAKA; 1 ♂, Ôdomari, Sata-chô, 15. x. 1963, A. TANAKA; 2 ♀♀, Ichiki, 13. v. 1962, A. NAGATOMI; 2 ♀♀, Ichiki, 18. iv. 1964, A. NAGATOMI; 8 ♂♂, 5 ♀♀, Ichiki, 18. iv. 1964, K. HASHIMOTO; 1 ♂, Ichiki, 18. iv. 1964, H. SHIMA; 2 ♂♂, 2 ♀♀, Ichiki, 8. v. 1984, A. NAGATOMI; 3 ♂♂, 5 ♀♀, Ichiki, 22. v. 1984, A. NAGATOMI; 1 ♂, Ichiki, 11. vi. 1984, A. NAGATOMI.

Holotype in Kagoshima University (Kagoshima) and paratypes in Kagoshima University, National Institute of Agro-Environmental Sciences (Yatabe, Ibaraki), Zoological Museum (Copenhagen), British Museum (Natural History) (London) and U. S. National Museum (Washington, D. C.).

This species is dedicated to Mrs. Yoshiko NAGANO (=formerly IKESHIMA) for her art work during the last six years (April, 1980 – March, 1986). Her long-term help to one of us (NAGATOMI) is greatly appreciated.

Acknowledgments

We wish to express our sincere thanks to Mr. K. HASHIMOTO, Mr. H. HAYASHI, Professor Emeritus S. ITO, Dr. K. KANMIYA, Dr. K. MORIMOTO, Mr. A. NAKANISHI, Mr. K. ÔHARA, Dr. H. SHIMA, Professor S. TAKAGI, Mr. A. TANAKA, Mr. Y. TAKAKURA, Dr. K. TSUNEKI and Mr. S. UEDA for their generous gift or loan of material and to Dr. K. KUSIGEMATI, Mrs. Y. NAGANO and Miss K. MOROI for their help in many ways.

References

IRWIN, M. E., & L. LYNEBORG, 1981. The genera of Nearctic Therevidae. *Ill. nat. Hist. Surv. Bull.*, **32**: 193–277.

LYNEBORG, L., 1976. A revision of the therevine stiletto-flies (Diptera: Therevidae) of the Ethiopian Region. *Bull. Br. Mus. nat. Hist.*, (Ent.), **33**: 191–346.

——— 1986. The genus *Acrosathe* IRWIN & LYNEBORG, 1981 in the Old World (Insecta, Diptera, Therevidae). *Steenstrupia*, **12**: 101–113.